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REMOVAL OF UPPER MAXILLARY BONE FOR MYELOID DISEASE. PALLIATIVE OPERATION TWO YEARS BEFORE.

[Read before the Boston Society for Medical Improvement, and communicated for the Boston Medical and Surgical Journal.]

By J. MASON WARREN, M.D.

W. A. B., a young man, 19 years of age, entered the Hospital April 7th, 1864. He was formerly a soldier. One year and a half before, a small swelling was noticed upon the outside of the gum of the upper jaw, near the first molar tooth, following an attack of typhoid fever and a severe cold in his head and face from exposure after a too early discharge from the hospital. Thinking a carious tooth in that vicinity might be the cause of the swelling, he had it removed; but the appearance of the tumor was unchanged. Twice an incision was made in it, giving exit to a quantity of blood each time. Nine months or a year after, it began to increase in size more rapidly. Upon admission to the hospital the tumor measured one and a half inches in diameter; was ovoid, hard, not tender upon pressure, painful at times, pain "streaming up" the side of the face, and at such times the eye was frequently bloodshot.

Operation.—April 9th, the patient was etherized; the lip was drawn up, exposing the tumor. An incision was then made in the protruding wall of the tumor. Through this opening the finger was passed into a cavity containing a pulpy substance, which partly filled the antrum, and which was scooped out by the fingers. There was free hæmorrhage from the opening, into which a piece of sponge was inserted.

A fragment of the tumor was examined by Dr. Ellis under the microscope, and found to contain the many nucleated plates of myeloid growth, and distinct isolated nucleated cells, such as are usually found in the same connection.

Sixteen days after the operation, the patient was discharged, relieved.

On Wednesday, Nov. 29th, 1865, he returned again to the hospital for the removal of the upper maxillary, the disease having recurred and made considerable progress. Since the previous operation he had served as a soldier in the volunteer army. The right side of the cheek was now occupied by a hard tumor, projecting the whole anterior wall of the antrum, and slightly impinging on the malar bone. The aperture mentioned in the previous account of the case was filled with a dark-colored, fungoid-looking mass, about the size of a chestnut. A consultation decided that the whole bone should be removed at once, as promising the only certain means of cure. The patient consenting, it was done in the following manner, which I shall describe in detail, as being the method which I have ordinarily pursued for the removal of the upper maxillary bone, and which leaves as little deformity as any of the methods proposed, where the disease to be removed is extensive. The patient being etherized sufficiently to carry him through the preliminary incisions, a sharp-pointed bistoury was plunged through the skin just above the zygomatic process of the malar bone. A curved incision was then made through the skin and muscles to the angle of the mouth. A bit of sponge had been previously stuffed into that cheek to prevent the blood from flowing into the fauces. When the skin of the face is more flaccid, as in old persons, this incision may be commenced lower down, thereby dividing fewer filaments of the facial nerve, leaving less paralysis. A too limited incision, however, embarrasses the section of the bones. The flap was now dissected rapidly up, the right ala of the nose cut away, and the contents of the socket dissected partially from the floor of the orbit. The bones now being well cleared, the vessels in the flaps were tied, the blood cleared away from the wound and a fresh application of ether made. With a small handsaw a groove was made in the ascending process of the malar bone and through the zygomatic process, and the section completed by the cutting forceps, the former incision extending into the spheno-maxillary fissure. The nasal process of the superior maxillary bone was now cut through in the direction of the same fissure. The mouth being held wide open, a vertical incision was made, with a strong, sharp-pointed knife, through the coverings of the hard palate as far back as the palate bone, and a lateral one from the termination of this behind to the root of the last molar tooth. Liston's large cutting forceps were now used to divide the bone, which they cleanly and efficiently did, the first incisor tooth having been previously removed. The whole mass was now seized with powerful hooked forceps and an attempt made to depress it, but it held fast at its junction with the pterygoid process of the sphenoid. A chisel was therefore driven in behind the bone and an attempt made to break its attachments, but without success. A blunt chisel was then inserted between the two maxillary bones, and by a prying motion the adhesion to the bone behind was broken off. The remaining soft attachments were divided by curved blunt scissors. The maxillary artery spouting out freely, was restrained for a moment by means of a sponge until the fauces were freed from blood and respiration was established. The vessel was then easily secured. After waiting until all hæmorrhage had ceased, the edges of the skin were accurately brought together by numerous sutures, great care being taken to nicely adjust the lip; and one or two sutures were taken in the mucous membrane.

The patient, although a powerful young man, seemed greatly depressed from the shock of the operation, and stimulants were freely administered. There was some oozing from the wound during the day. For a number of days the pulse remained feeble and the strength much depressed. At the end of two weeks the powers of life revived, and he then began to recover with great rapidity. The paralysis of the face, which is sometimes very marked, was less than usual, and with a slight effort the eyelids could be nearly closed. Sight was not impaired. The union of the wound was perfect, except at one small spot where a salivary fistula seemed to threaten.

On inspection of the diseased part, the cavity of the antrum was found filled with a soft, dark-colored, spongy mass, which, under the microscope, presented the well-marked characters of myeloid disease. The disease was entirely removed by the operation.

Remarks.—The incisions made in the soft parts in this case leave as little deformity as any of those suggested for the excision of this bone. Gensoul recommends incision of the upper lip, a cross cut through the cheek and a perpendicular one at the end of this, leaving three very disagreeable scars. Fergusson, a simple cut through the upper lip into the nostril, or possibly a continuation of this incision around the margin of the ala and up the side of the nose; but these would hardly give room in a case like the present. In regard to the bones, it has been recommended to make one cut through the maxillary process of the malar bone into the spheno-maxillary fissure, instead of dividing the zygoma and the frontal process of the malar bone. The objection is that the development of the tumor generally occupies the whole cheek and prevents, in most cases, the execution of the plan proposed. The trying point of the operation is the adhesion of the maxillary bone to the pterygoid, made more firm by inflammatory action, so that in malignant diseases, in attempting depression of the bone, the front part of the antrum is apt to break away from the posterior portion, requiring the back part to be subsequently removed with the chisel or forceps.

The little deformity left from so very great an operation is remarkable. There is a slight paralysis in the cheek, and at first a confusion in the speech and some difficulty in deglutition, which can almost completely be remedied by artificial appliances of gold, gutta percha or hard India rubber.

With a little management, a much larger portion of the soft parts covering the palate might be saved, as they peel off easily when the bone is depressed.

This patient recovered perfectly. The salivary fistula, which it was feared would be permanent, closed after two or three free applications of caustic. The voice and deglutition were, of course, very much impaired by the great cavity left after the removal of the bone. These, however, were completely restored by the ingenious construction of a hard rubber obturator and palate, made by Dr. Rufus E. Dickson, dentist. He now speaks well; liquids no longer regurgitate through the nostrils, and on the first of March he left for his home in New York. He was previously present and examined by the members at one of the meetings of the Boston Society for Medical Improvement, and the pathological specimen exhibited at the same time.

THE INOCULABILITY OF TUBERCLE.

[Read before the Société Médicale des Hôpitaux February 28, 1866, by M. Herard, Physician of Lariboisiere, and translated from the Union Médicale of March 8 for the Boston Medical and Surgical Journal.]

YOU remember, gentlemen, that in a recent communication to the Academy of Medicine, Dr. Villemin, associate professor of Val-de-Grace, announced that he had succeeded in inoculating rabbits with tuberculous matter from phthisical patients, and laid down the following propositions:—

Pulmonary phthisis, like tuberculous affections in general, is a specific disease.

Its cause exists in an inoculable agent.

Tuberculosis belongs to the class of virulent maladies, and should take its place in nosology by the side of syphilis, but perhaps nearer to glanders and farcy.

Desirous of verifying for ourselves the experimental fact which served as the base for such important and unexpected conclusions, M. Cornil and myself have made some inoculations, and although our experiments were not so prolonged as we had wished, the results nevertheless that they have furnished have seemed to be remarkable enough to be worth communicating to you. Let us say at once that these results are confirmatory of those of M. Villemin.

We have submitted to experiment seven rabbits about six weeks old. Six of them were placed in a large rectangular box, where they could move about and breathe at ease; the seventh was allowed full liberty. Upon this one, as well as one of the remaining six, no inoculation was practised. Of the remaining five, three were inoculated exclusively with the matter from grey tuberculous granulations, semi-transparent or opaque, yellowish, collected from the peritoneum and pleuræ of a phthisical patient. For the two last we employed exclusively caseous matter carefully extracted from the lungs—the caseous matter which is yet considered by the majority of physicians as the type of tubercle, but which in our opinion is but a catarrhal pneumonia which has reached the retrograding fatty stage, caseous pneumonia.

The inoculation was done twice, on the 12th of December and the

1st of January, according to the method indicated by M. Villemin. With a narrow-bladed bistoury we made a subcutaneous puncture near the base of the ears, and in the wound thus produced we insinuated small portions of the substances mentioned above, which we had previously broken up by triturating them with the point of the instrument.

The seven rabbits, placed in a large cellar, sufficiently ventilated and well fed, were killed a fortnight since, about two months after the first inoculation. The following are the results furnished by an examination of their organs:—

1. The two rabbits which had not been inoculated presented no lesion of the lungs or other viscera which could be referred to tuberculosis.

2. The result was equally negative with regard to the two rabbits inoculated with the caseous pulmonary matter.

3. As for the rabbits inoculated exclusively with the matter of the granulations, two of them (the third being kept for a more prolonged experiment) exhibited in the lungs evident tuberculous lesions, although as yet but little advanced.

These lesions consisted in a group of numerous, small, semi-transparent, hard, grey granulations, cutting easily, giving a smooth section, in places a little opaque in the centre. Their substance, somewhat resisting, was composed of very small spherical nuclei, grouped together, with granular matter or fibres. These granulations resembled precisely those of man, and at the same time M. Cornil was able to satisfy himself that they were identical, both in external appearances and in histological composition, with those found in the lungs of the rabbits inoculated by M. Villemin, which had been kindly placed at our disposal.

The lower lobe of the lung in one of the two rabbits was strongly congested throughout a considerable portion of its substance, and the parts in the neighborhood of the granulations contained large epithelial cells in the process of endogenous multiplication, and white corpuscles.

In addition, in the same rabbit, there was seen under the skin, on the right side of the neck (the side of the inoculation) a chaplet, as it were, of enlarged, softened, yellowish glands. One of these glands measured about one centimetre and a half in length. Their pulpy, opaque tissue broke down into a caseous, thick *bouillie*, and under the microscope could be seen, with the fibroid substance which formed the frame-work of the gland, lymph cells, nuclei or small cells, larger generally than in the normal condition, and infiltrated with fine granular and fatty matter.

The peritoneum contained numerous vesicular worms, and the liver of one of the two rabbits showed little yellow and grey points, which at first, as M. Villemin remarked, might have been taken for tuberculous granulations, but which microscopic examination revealed to be the perfectly distinct eggs of the parasitic worms which are very common in rabbits.

The lesions which we are describing were too limited and too little advanced to produce well-marked functional trouble; and besides, the history of the diseases of rabbits, and particularly of pulmonary tuberculosis in them, has not, so far as we have learned, up to the present time attracted much of the attention of veterinary surgeons.

What appears to be about demonstrated is, that the rabbit may become tuberculous like most other domestic animals, and that, in certain irritations of the mucous membrane of the air-passages, more than in tuberculization, the cough is a sort of sneeze.

Our rabbits did not cough; one of them, that in which the lesions were the most pronounced, seemed to us to have embarrassed respiration; both had evidently lost flesh, and each presented a deep eschar in the middle of the upper part of the thigh. Was this eschar the result of deranged nutrition or of some other cause? We are in doubt. All that we can say is, that neither of the other rabbits, inoculated or not, presented such a lesion.

The preceding facts seem to us to demonstrate, as M. Villemin has shown, that tubercle is inoculable from man upon the rabbit. But at the same time they enable us to establish a distinction, which we believe to be a radical one in the history of tuberculosis, between the granulation, the specific, characteristic lesion, and the inflammatory caseous products which are developed in the lung about it. The one is inoculable; the others, if our view is the correct one, are not. We think that this distinction, founded on many other circumstances, has a real importance, and that, in this particular case, it will be sufficient to explain the contradictory facts, which will not be wanting, to be brought into opposition to M. Villemin's experiments.

We shall not follow our learned brother into the nosological considerations to which his interesting discovery has led. We do not propose to inquire just at what point the generally received ideas upon the nature of pulmonary phthisis, its non-contagiousness, &c., must be modified. We believe that this discussion would be to-day premature, and that it could not be profitably undertaken until new experiments of inoculation have been tried on different species of animals. What we have wished to do at this time was, to verify for ourselves the exactness of the experimental fact, as a point of departure for ulterior researches; and, as we have said, this fact appears to us to be established beyond all dispute.

HUMBOLDT MEDICAL COLLEGE OF ST. LOUIS.—From the plan of this Institution, as announced in the *St. Louis Medical Reporter*, we learn that it proposes to devote itself particularly to the training of medical students for the practice of specialties.

RELATIVE ACCOMMODATION.

[Communicated for the Boston Medical and Surgical Journal.]

In Donders's "Accommodation and Refraction of the Eye," Chap. III., p. 110, the following passage occurs:—"It is easy to convince one's self that both eyes together, as well without as with slightly concave or convex glasses, can *accurately* see an object at a definite distance, and that, consequently, *without change of convergence*, the accommodation can be modified." The italics are ours. Upon this principle is based his determination of the amount of relative accommodation, that is, of accommodation for a given convergence of the optic axis. See pages 114, 118. The above principle, however, appears to conflict with an experiment, substantially that referred to by Giraud-Teulon in Chap. X. of his Binocular Vision, as follows:—

Let each eye be armed with a convex glass of six inches focal distance, and in order to avoid the prismatic effect of the lateral portions of the glasses, let them be covered, except over a circle of about an eighth of an inch in diameter at the centre. Let the object to be looked at be a short, thin, black line on white paper at above five inches from the eye. Adjust each glass separately, so that the line appears sharply defined and in the middle of the space seen through the uncovered portion of the glass. Then on looking with both eyes at once, the object, the line, is *at first* seen double, the right image by the left eye, and *vice versa;* after an interval of time, greater or less, the two images become combined, by lateral movement towards each other, into an *indistinct* line, or two lines very near to each other, *both indistinct.*

According to Giraud-Teulon, each picture is seen in the direction of the object, but owing to the effect of the convex glass, farther off than the object; in this way the double images are readily accounted for, and also the circumstance of their being crossed. He also thinks that in combining the two pictures, the eyes turn farther inwards. The experiment, then, seems to show either that during the binocular union of the two pictures the optic axes do not remain directed towards the objective line, or, judging from the indistinctness of the combined picture, that the eyes are not exactly accommodated for the rays as they come from the glass; in either case an inconsistency with the principle referred to above. It may be said that Donders specifies "*slightly* concave or convex glasses"; but if the principle does not hold for a glass of six inches focal distance, it would hardly be trusted for weaker ones.

In the above communication, it is not intended to question the existence of relative accommodation, but only the propriety of determining its amount by the method of looking with both eyes at once.

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[*] Physiologie et Pathologie Fonctionelle de la Vision Binoculaire, etc. Paris, 1861.

ON A NEW AND READY METHOD OF PRODUCING LOCAL ANÆSTHESIA.

By BENJ. W. RICHARDSON, M.A., M.D., F.R.C.P., Senior Physician to the Royal Infirmary for Diseases of the Chest.

SOME years ago I published in the columns of the *Medical Times and Gazette* some researches for the production of local anæsthesia by a process which I designated voltaic narcotism. Those researches, very much praised on the one hand, and very rudely and unfairly attacked on the other, failed in the end in leading me directly to any practical means of producing local insensibility applicable to surgical proceedings. The causes of failure were threefold. The apparatus required was cumbersome; the application was painful; the result was uncertain. In the course of the past year a similar series of experiments have been made by an Italian physician; but whether in imitation of my previous labors or in ignorance of them, I do not know: they have proved equally unsatisfactory.

The researches on voltaic narcotism, although practically of little value, were not in reality without their use. Previously to making them I was quite conversant of the fact—indeed, I learnt it from Snow—that all the narcotics produced anæsthesia by the process of arresting oxidation; but I had still to learn what Snow himself had not reached, that arrest of oxidation meant, in the end, arrest of motion; and that anæsthesia, in truth, means the temporary death of a part influenced—*i. e.,* inertia in the molecules of the part.

Learning this, I discovered that voltaic narcotism had at its base a fault. My idea in it was, that by quickening the circulation of a part by galvanic stimulus, and by applying over the part where circulation was quickened a narcotic solution which the blood could absorb, I could so charge the blood locally with narcotic substance as to produce local insensibility. In feeble subjects, as the result proved, local narcotism could, in this way, be temporarily set up; but it was always attended with a certain amount of disorganization. In strong subjects it failed altogether, because such of the narcotic as might be absorbed was carried rapidly into the general circulation. In plain words, by the use of the galvanic current, I was committing the paradox of applying a form of motion for the indirect production of inertia.

The failures I experienced at the period referred to in no degree lessened my efforts to find a practical means for producing local insensibility. They simply caused me to think more on the whole subject, and to invent new methods of inquiry. I came at length to the conclusion that Dr. James Arnott's plan of using extreme cold was the first true step in the progress of discovery, and that if it could be made easier of application, and at the same time could be combined with the use of a narcotic fluid, an important advance in therapeutics would necessarily follow. For full four years this truth has been before my mind, and I have made numerous experiments with the view of demonstrating it. At one time I tried to freeze parts by the application of ice and salt, and then to inject by the hypodermic plan narcotic solutions into and beneath the frozen tissue. These experiments were never sufficiently satisfactory to allow of their publication. At last I hit upon a method which I am now about to describe, and which, although admitting of very considerable improvement, is sufficiently important to justify me in laying it before the profession.

THE ANÆSTHETIC SPRAY PRODUCER.

When the toy for diffusing eau de cologne in fine vapor over the skin, in the form of spray—which some time ago found its way into our drawing-rooms—first came before me, it struck me at once that it might possibly be applied to the production of local anæsthesia; and I set to work to try its applicability in this respect. I was soon afterwards assisted largely in my labors by taking advantage of Siegle's apparatus, with the hand-ball spray-producer invented by my valued friend Dr. Andrew Clarke, and supplied by the manufacturers, Messrs. Krohne and Sesemann, of Whitechapel road.

With this apparatus I set myself to determine the degree of cold that could be produced by the vaporization of all the known volatile liquids, and I determined the fact that the intensity of the cold produced held a definite relationship to the boiling-point of the fluid used; the rule being that the lower the boiling point the greater was the amount of cold exhibited. In these inquiries I employed a very delicate thermometer, directing the spray upon the bulb from half an inch to an inch and a-half from the point of the jet. By these means I learnt that with rectified sulphuric ether I could bring down the thermometer within 10 degrees Fahr. of zero, and that by directing the jet on the skin I could produce a certain definite and marked degree of local insensibility, but not sufficient for surgical purposes.

I next got Mr. Krohne to construct for me a hollow cylinder of thin metal, six inches long and three inches in diameter. In the circumference of this cylinder was a chamber one-eighth of an inch in diameter for containing ether. The ether communicated with a tube which was joined to an air-tube, as in Siegle's apparatus, and the centre of the cylinder was filled with ice and salt mixture. In this way the ether was reduced to zero, and when vaporized gave spray which brought down the thermometer siz degrees below zero, and produced on the skin such entire insensibility that I could pass a needle through the part without sensation. On the 11th of December, 1865, I applied this process for the first time on the human subject for an operation. The patient was a lady, who required to have five front teeth extracted. I had previously administered chloroform to this lady for a tooth extraction, but the inhalation had produced so much irregularity in the action of the heart and other disagreeable symptoms, that I considered it inadvisable to repeat chloroform, and she herself was only too ready to give the local measure a trial. The extraction was performed by my friend, Mr. Peter Matthews. On directing the ether spray first at a distance and then closely upon the gum, over the first central incisior on the left side, we observed, at the end of fifty seconds, that the gum had become as white as the tooth itself, and quite insensible. I then directed the vapor upon the tooth for twenty or thirty seconds more, and on the patient intimating that she did not feel, I suggested to Mr. Matthews to proceed. He extracted a very firm tooth without the slightest expression of pain. The process being continued in the same manner, he extracted three other teeth with the forceps. The other gave way, and had to be removed by the lever; but in all cases the result was equally good. Not a drop of blood was lost; there was no painful reaction; and the healing process proceeded perfectly. Our patient, who was exceedingly intelligent, was specially requested to note every step of the operation, such as the applying of the forceps, the insertion of the blades beneath the gum, the loosening process, and the removal. She told us that in two of the extractions she felt nothing; that in one it seemed as though the jaw altogether were being pulled downwards, but without pain; that in another she was conscious of a kind of wrench or loosening but without pain, and that the introduction of the lever was attended with a momentary dull ache, just perceptible. On the whole, the process was quite as painless as when she took chloroform.

On December 13th I applied the local anæsthetic to the same lady for the further extraction of nine teeth, Mr. Peter Matthews again operating. The results were equally good with the first seven, at which point, unfortunately, the apparatus partly ceased play. At the eighth tooth pain was felt, and at the ninth, the apparatus being out of play, the operation caused great pain. We regretted this much, although it gave us the information of the perfect action of the process when no mechanical obstacle interfered with it. The reason why the apparatus stopped play was very singular, and could hardly have been foreseen. It arose from the condensation of water derived from the air in the air tube, and from the blocking up of the fine jet with a little portion of ice.

In the next step of research I got Mr. Krohne to make for me an apparatus with two spiral tubes, one the air tube, the other a tube for ether; and I immersed these spirals in a closed chamber filled with ice and salt. The degree of anæsthesia at first produced was most intense, and Mr. Spencer Wells was good enough to allow me the opportunity of applying the process in a case where an operation was required for closing a perineal rupture. Unhappily the apparatus, from the very same cause as before, ceased to yield a current; water condensed and became frozen in the air-tube. The apparatus itself was also found to be too cumbersome for practical purposes; I therefore, in this trial, failed to obtain any result.

By this time I had been led, very reluctantly, to the fact that the use of ice and salt for reducing the ether was a failure when the plan came to be tried in practice, nor could I see any ready way of preventing the difficulties that were brought before me. Added to these difficulties there was another, which has always attended my friend Dr. Arnott's plan, viz., that of getting the ice and salt readily for operation. To succeed, therefore, it was requisite to dispense with ice and salt altogether.

In considering how this object could be achieved, it occurred to me that if a larger body of ether than is supplied by Siegle's apparatus could be brought through the same jet, by mechanical force, in the same interval of time, and with the same volume of air, a proportionate increase of cold must necessarily be produced. The theory was one of pure physics, admitting even of arithmetical demonstration, and running parallel with the lessons which had been taught me with respect to the cold produced by liquids having different degrees of boiling point. The theory was put to the test at once, and proved correct to the letter. By driving over the ether under atmospheric pressure, instead of trusting simply to capillary action—or to suction, as in Siegle's apparatus—the spray evolved brought the thermometer within thirty seconds to four degrees below zero—the result that was desired.

Ascertaining this truth, I instructed Messrs. Krohne and Sesemann to construct a proper apparatus. It consists simply of a graduated bottle for holding ether; through a perforated cork a double tube is inserted, one extremity of the inner part of which goes to the bottom of the bottle. Above the cork a little tube, connected with a hand bellows, pierces the outer part of the double tube, and communicates by means of the outer part, by a small aperture, with the interior of the bottle. The inner tube for delivering the ether runs upward nearly to the extremity of the outer tube. Now, when the bellows are worked, a double current of air is produced, one current descending and pressing upon the ether forcing it along the inner tube, and the other ascending through the outer tube and playing upon the column of ether as it escapes through the fine jet. By having a series of jets to fit on the lower part of the inner tube, the volume of ether can be moderated at pleasure; and by having a double tube for the admission of air, and two pairs of hand bellows, the volume of ether and of air can be equally increased with pleasure, and with the production of a degree of cold six below zero.

By this simple apparatus, at any temperature of the day and at any season, the surgeon has thus in his hand a means for producing cold even six degrees below zero; and by directing the spray upon a half-inch test-tube containing water he can produce a column of ice in two minutes at most. Further, by this modification of Siegle's apparatus he can distribute fluids in the form of spray into any of the cavities of the body—into the bladder, for instance, by means of a spray catheter, or into the uterus by an uterine spray catheter.

When the ether spray thus produced is directed upon the outer skin, the skin is rendered insensible within a minute; but the effects do not end here. So soon as the skin is divided the ether begins to exert on the nervous filaments the double action of cold and of etherization; so that the narcotism can be extended deeply to any desired extent. Pure rectified ether used in this manner is entirely negative; it causes no irritation, and may be applied to a deep wound, as I shall show, without any danger. I have applied it direct to the mucous membrane of my own eye, after first chilling the ball with the lid closed.

I have now employed this mode of producing local anæsthesia in four cases on the human subject. The first case was the extraction of a tooth from a lady, the operation being performed by my friend and neighbor, Dr. Sedgwick, on January 24th of this year. On the 29th of the same month I used it again on the same lady for the extraction of three very difficult teeth, Dr. Sedgwick again operating. The results were as satisfactory as in the previous case, where the ice and salt ether apparatus was used.

I have used the apparatus also in connection with my friend Mr. Adams, who had a case at the Great Northern Hospital of deep dissecting abscess in the thigh of a young woman. In the abscess there was a small opening, which just admitted the director. I first narcotized around this opening, and the director being introduced, Mr. Adams carried his bistoury nearly an inch deep and one inch in the line of the director. I then narcotized the deep-seated parts, and enabled him to cut for another inch and a half in the same direction. The director was then placed in the upper line of the abscess, the process was repeated, and the incision was carried two and a half inches in that direction. The patient was entirely unconscious of pain, and after narcotizing the whole of the deep surface, Mr. Adams inserted his fingers and cleared out the wound without creating the slightest evidence of pain.

Afterwards, in the case of a lacerated wound, six inches long, in the arm of a boy, who had been injured with machinery, I narcotized while six sutures were introduced by Mr. Adams. The first needle was carried through without the anæsthetic, and caused expression of acute pain; the remaining eleven needles, after a few seconds' administration of the ether spray, were passed through painlessly. The twisting of the wire sutures gave no pain.

These results are so interesting that I make no apology for bringing them at once before my medical brethren. I wish it to be distinctly understood that at the present moment I only introduce the method here described for the production of superficial local anæsthesia. It is, I believe, applicable to a large number of minor operations, for which the more dangerous agent chloroform is now commonly employed—I mean such operations as tooth extraction, tying nævus, tying piles, incising carbuncles, opening abscesses, putting in sutures, removing small tumors, removing the toe-nail, dividing tendons, operating for fistula, removing cancer of the lip, and other similar minor operations which I need not mention. The process may also be applied to reduce local inflammation.

In course of time, and guided by experience and the advancement of science, we may, however, expect more. If an anæsthetic fluid of negative qualities, as regards irritation of nerve, and which has a boiling point of 75° or 80°, can be obtained from the hydro-carbon series, the deepest anæsthesia may be produced, and even a limb may be amputated by this method. It may also turn out that certain anæsthetics may be added to the etherial solution with advantage, such as small quantities of chloroform, or some of the narcotic alkaloids, if they could be made soluble in ether. A solution of morphia and atropia combined, if they could be diffused through ether, which at present seems impossible, could thus be brought into action so as to cause deep insensibility. In operating on the extremities it would be good practice to stop the current of warm blood by making pressure above on the main artery.

Reaction from the anæsthesia is in no degree painful, and hæmorrhage is almost entirely controlled during the anæsthesia.

One or two precautions are necessary. It is essential, in the first place, to use pure rectified ether; methylated ether causes irritation, and chloroform, unless largely diluted with ether—say one part in eight—does the same.

The *modus operandi* of this process is exceedingly simple. It acts at first merely by extracting force, and afterwards, when the nervous filaments are exposed, by preventing the conveyance of force through them. To be plain, sensation means the conveyance of force or motion from the extreme parts to the brain. The motion is communicated by the blood in the form of heat: it is communicated to the nervous filaments, and by them is conveyed to the sensorium. This is passive sensibility. When we irritate a nervous fibre, as by a cut, we communicate more motion rapidly along that fibre and cause pain. This is active or exalted sensibility. To remove sensibility, therefore, we must adopt one of three processes: we must remove or render inert the sensorium; we must stop the evolution of force generally by arresting oxidation of blood; or we must rob the body locally of its force beyond that with which it is constantly being renewed. We see the first of these processes in action in cases of pressure on the brain, as from injury or effusion of blood; we see the second whenever we produce general anæsthesia by charging the blood with chloroform or other analogous anæsthetic; and we see the third when, by means of extreme cold, we rob the local part of the force that has been brought to it by the blood.

The problem of local anæsthesia will consequently be quite solved when by a rapid process we can exhaust the natural force of a part as fast as such force is evolved in the local structure; and especially when with this we can combine the action of a substance which for the moment controls, as by compression, the conducting power of nerve matter. These two latter objects are to a large extent carried out by the method I have described above.—*London Medical Times and Gazette.*

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON: THURSDAY, APRIL 12, 1866.

OUR STATE CHARITIES.

THE intense interest which has been recently excited wherever the English language is read by the narration in a public journal of what was witnessed during a night spent in one of the great pauper establishments of London, and the popularity of newspaper articles concerning criminals and details of detective proceedings, considered in connection with the agitation produced not long since by a tale of fiction about an English lunatic asylum, illustrates how little is really known by the public of the ways and wants of the poor and vicious and insane, and how great, however morbid, is the popular curiosity concerning them. Were half this eagerness manifested in practical efforts to prevent crime and reform the criminal, which is now shown in painting it in false and dangerously fascinating colors and in hunting and hanging and screening him, society would be vastly happier and healthier. A true home picture of vice and crime, with all its details of brutality and misery, would be an effectual antidote to this unnatural craving for sensational writings.

It is well for the public that there are those who look upon this large class, the poor, vicious, insane and criminal, as objects of a different sort of interest and worthy of careful study, who believe that we are in part responsible for its present condition and may lessen its growth in the future. These views, which are based upon an investigation into the causes of these evils, and aim at prevention as well as reformation, are ably presented in the report of the Board of State Charities, recently issued as a public document. This commission was created but two years ago "to investigate and supervise the whole public charitable and correctional institutions of the Commonwealth, and to recommend such changes and additional provisions as they may deem necessary for their economical and efficient administration," and this is its second annual report. With that of the Secretary and General Agent of the Board it forms a volume of 450 pages, and is one of the most important documents ever published by the State. The gentlemen composing the Board are eminently fitted to fulfil the duties entrusted to them and fully sensible of their magnitude, as will be seen by the nature of the subjects to which they have devoted their attention :—

"1st. On the subject of Statistics.

"2d. Upon the importance of drawing the attention of the legislature and of the people to those natural laws and social conditions upon which so surely depend, in every community, the average duration of human life—the average number of working years in individual life—the numerical proportion to the whole population of the defective or infirm class—of the dependent or pauper class, and of the vicious and criminal classes.

"3d. Upon the importance of enlisting the people themselves in the direct work of social reform—of elevating the dependent classes, so that public charities and reformatory agencies may be lessened in number and contracted in sphere.

"4th. To show that the system of providing large public institutions for the permanent dwelling of special classes of the dependent is unsound in principle ; that such establishments are only to be tolerated as a choice of evils ; and consequently that they should not be multiplied, and those existing should not be enlarged without pressing necessity."

These subjects are all most carefully considered and pointedly illustrated, and we wish it were in our power to give our readers an adequate idea of the important and practical conclusions to be drawn from them. We can only offer them a few extracts illustrative of the manner in which they are treated. The dependent and criminal classes are thus enumerated :—

"Massachusetts contains (in round numbers) about five hundred blind, four hundred deaf mutes, three thousand insane, twelve hundred idiots, and ten thousand paupers, who, with few exceptions, are supported by the public or by their friends.

"There are those who cannot support themselves, because of infirmity, or sickness, or feebleness of mind ; those who will not support themselves because they possess substance gathered by others ; and those who are idle from bad training or bad habits.

"Then there is the hideous army of drunkards, with its foul purveyors, whose ensigns are seen in our streets by day ; while at night the sad procession of fallen women walks abroad ; and the pestilent vermin that minister to evil passions and lust creep about in by-places. All of these are consumers, none of them producers ; and most of them not merely cumber the earth, but require constant care of some useful workers.

"Then there are the destructives—the parasites of the body social —some of whom wander up and down, pilfering and stealing ; others sit and contrive ways and means for gambling, cheating, fraud and mischief of various kinds ; while others distil and deal out poison to keep the whole crew excited and active.

"All of this class destroy and waste, not only not giving anything back to society, but needing some of the working class to repress and keep them down, and circumscribe their work of destruction.

"These helpless, dependent, idle consumers, and destructives, number at least forty-five thousand ; and they make an enormous load which cannot be cast aside, cannot be left behind, but must be taken up and borne along by the body social.

"Nor is this all the load to be borne, for at least five thousand workers must be employed in the care of these dependents. Nor even then have we counted enough, for of all the living, a considerable number are children or old persons who are under or over the period of life during which men earn more than they consume, so that they, too, have to be added to the great burden. * * * *

"It would be a vain attempt to consider fully in a single report, or even in a volume, *all* the causes of the existence of such a large proportion of dependent and of destructive members in our community, and in every community. A brief allusion to some of them, however, may be pardonable here.

"The causes of the evil are manifold, but among the immediate ones, the chief cause is inherited organic imperfection—vitiated constitution—or *poor stock*.

"The vitiation or imperfection of the stock is mainly of two kinds. First, lack of vital force; second, inherited tendencies to vice.

"The first comes from poor nutrition, use of stimulants, or abuse of functions, on the part of the progenitors.

"The second comes from their vicious habits of thought and action.

"The first, or lack of vital force, affects mainly the dependent class, and lessens their ability for self-support; the second affects more the vicious class, and lessens their ability for self-guidance."

Among these causes of vitiation in human stock alcohol is considered as one of the most prolific, and the effects of tippling and drunkenness are thus contrasted:—

"Drunkenness not only tends to shorten life, and, of course, the duration of procreative desires and powers, but it depresses the latter during the fit. Progeny, therefore, will tend to lessen in number. Moreover, if there is total abstinence during the intervals between the fits, the body may get into a normal condition by virtue of the tendency which alcohol has to be eliminated and to disappear rapidly from the system. There is a chance, therefore, that the offspring of occasional drunkards may escape alcoholic influences.

"On the other hand, alcohol taken continually in small doses does not sensibly shorten life, nor sensibly lessen the period of procreative desires and powers; the offspring, therefore, will not necessarily be fewer. But since the system is always under the influence of the poison, there can be no chance for them to escape its influence.

"Careful observation will, therefore, probably show that besides a numerical difference between the offspring of drunkards and the offspring of tipplers, there is also a difference of condition.

"Procreation during drunkenness is rare, but the cases where it is followed by fearful defects, deformities and passions in the offspring, are too numerous and well established to admit a doubt of the nature of the cause. We may expect in less-marked cases to find tendencies to mental disturbance, and to excitability which leads to passion and violence; and may, therefore, expect to find offspring of drunkards tending to the criminal class.

"With tipplers, on the other hand, there is gradual vitiation and impairment of vital force. We may, therefore, expect that, other things being equal, their progeny will tend more strongly than the children of temperate people, or even of occasional drunkards, to fall into the dependent or pauper class, by reason of the cause mentioned elsewhere as occasioning so much pauperism, to wit, original lack of vital force."

With regard to the provision for disabled soldiers, the report makes the following prudent suggestions :—

"We cannot be too grateful for the services rendered ; too reverent of the memories of our dead heroes, or too tender and generous to those survivors who need sympathy and aid. But we must remember that the warmer is the public heart, the more need of right direction for its impulses. Many of our soldiers may need *homes*, but such homes as we ourselves need ; and a great institution, with its congregation of one sex—with its necessary discipline and its monotonous life—never was and never can be such a home as our deserving veterans ought to have.

"Better the poorest hut in a retired hamlet, with its single family gathered round the hearthstone, where,

'The broken soldier, kindly bade to stay,
Sits by the fire and talks the night away,'

than a showy building, set upon a hill, with its corps of officials, its parade of charity, and its clock-work and steam for doing domestic work so thoroughly that it is robbed of all its old and endearing associations. Unless some as yet undiscovered method is found to check the evil tendencies of all institutions which congregate persons of one sex, and substitute artificial for real family influences, soldiers' homes, or asylums, or refuges, will be likely to share the fate of like institutions in older countries. They will degenerate like the Invalides and the Quinze Vingts in France, and the Greenwich Hospital in England ; and a succeeding generation will be occupied, as is the present generation abroad, in correcting their evils or cutting at their roots.

"There is danger, indeed, that our institutions may not start under as favorable auspices as did some of the foreign ones. They were at first filled with well deserving veterans who had been actually wounded, or blinded, or disabled in war. But the signs already portend that into ours will press hardly any respectable Americans, few deserving foreigners, but a multitude of 'bounty-jumpers and shirks,' who want to eat but not to work. * * * *

"Better have five hundred maimed veterans stumping about the towns and villages of Massachusetts, living partly on their pension and partly by their work, than shut up in the costliest and best structure that art could plan or money build."

One of the main objects of the report is to show the importance of separation and diffusion in the treatment of paupers and juvenile offenders, and the evils of the present system of massing are forcibly told :—

"It sometimes happens that there is a powerful, zealous, magnetic man or woman at the head of an almshouse, out of whom goes virtue enough to keep down the evil ; but they are rare. Whatever may be done in large almshouses, by the aid of soap and whitewash, to keep down the pauper smell, there is no moral disinfectant strong enough to keep down the pauper spirit, if it once becomes the spirit of the majority, for it grows and intensifies with numbers ; and it becomes so unwholesome and baleful that virtue can hardly be kept alive, much less flourish and grow there. Even hope, which springs eternal in the human breast, springs not in the great almshouse, over whose gates might be written, as over those of a lower deep—

'Leave ye all hope behind, who enter here.'

* * * * * * * * *

"If our State institutions were places for raising cattle or horses, experiments might be allowed, and the treatment might vary according to the theory of the superintendent. But it is time that we had settled upon some axiomatic principles of education; and that we should not be challenged to prove that, with the young, 'evil communications corrupt good manners.'

"Massachusetts presents two schools for training up mechanics. The first is the ordinary family, scattered over a thousand hills; with the ordinary workshops in towns, villages and hamlets.

"The second is kept in three great almshouses and three reformatories. Those who have charge of the wards of the Commonwealth may select either of these schools. Some of them seem to believe that the latter is the best; and they will prove their faith by their works whenever they send their own sons and nephews there to learn a trade."

The same plan of distribution is recommended as of equal importance in the management of deaf mutes and the blind, and the Board also advises the removal of the insane and idiotic from the almshouses to the receptacle at Tewksbury, and of all children and criminals from association with their inmates. The sanitary condition of these great "institutions," which they think should be broken up, and of the State insane asylums, is carefully examined, and many judicious changes in their management are recommended. With regard to the state of the Bridgewater Almshouse, concerning which there has been some agitation, we find the following opinion expressed:—

"The continued prevalence of diseases of the eye, especially at the Bridgewater almshouse, has occupied the attention of the Board, and has been made the subject of special investigation, and of a special report.

"In substance, it is, that ophthalmia (a generic term for various diseases of the eye) has become endemic and persistent. It may be called the one disease, especially at Bridgewater. It gives more trouble, entails more expense, and causes more suffering than any one disorder. It necessitates the creation and maintenance of sore eye wards as a necessary and important feature of our State almshouses. Worse than all, it causes in many a life-long weakness of sight, and, in not a few, total blindness.

"The congregation of such large numbers of the pauper class in such close quarters, doubtless creates a strong disposition to develope ophthalmias. The effluvias vitiate the atmosphere, and affect first the exposed mucous membrane of the eye. But the effect of this might have been greatly diminished, if not entirely counteracted, by sufficient hospital accommodations. The lack of these, therefore, is the immediate cause of the evil, though the remote one is too much confinement to the house.

"The cost, in trouble to the officers of the institution and in suffering to the inmates, in consequence of the prevalence of ophthalmia, cannot be easily calculated, but it is very great. Then if we estimate that only twenty children have been rendered blind for life; that it will cost, at least, one hundred dollars a year to support each one of them; and that, on an average, they live twenty years, we expend three thousand dollars a year in the attempt to remedy an evil which might have been prevented by an outlay of twenty thousand dollars —a very high rate of interest, especially as the results of the attempt are unsatisfactory. The general conclusion is that there has been, and is, a great deal of pain and suffering which might have been spared. * * * * * * * *

"With respect to the disease and mortality at Bridgewater, a Committee of the Board having investigated the subject, I need not discuss it at any length. But, as my remarks concerning it a year ago were thought by the physician at Bridgewater to be unsupported by the facts of the case, I will quote his explanation of the great mortality there, from his Report for 1865:—

"'The number of deaths in proportion to the number of cases treated may seem at first view to be large, but on close inspection of Table No. 2, which shows the causes of this mortality, no one can be surprised at the amount. There were twenty-nine deaths from consumption, thirteen from marasmus, eight from paralysis, seven from cancer, three from hernia, and sixteen from old age. Many of these cases of consumption, paralysis, cancer and hernia, had been previously treated at other hospitals, or by physicians and surgeons in private practice, pronounced incurable and sent here to die. Twenty-one died who had passed their threescore and ten years; of these, seven had passed their fourscore years; of these, three had passed their ninetieth year, and one lived to the extraordinary age of ninety-seven years.

"'If proper allowance was made for these fifty-six cases of incurable disease, and also for the twenty-seven "foundlings"—for experience shows that three out of four of such children die before they have completed their first year—it will then appear that the mortality in this institution is no greater in proportion to the cases treated, than in other hospitals where such patients are not admitted. The larger number of consumptives which annually swell the list of mortality here in proportion to the like cases in other almshouses in the State, is accounted for in part by arrivals of Kanakas and Western Islanders from the whaling ships of New Bedford. The climate of this State is very unfavorable to this class of invalids. Besides, the statistics of the causes of mortality show that death from consumption is more frequent in the southeasterly counties than in other parts of this State.'

"These statements explain why the mortality should be great in *all* the almshouses, but I must be permitted to doubt whether they explain satisfactorily the larger mortality at Bridgewater, and for this reason: During the present year I made an examination of the register of deaths at Bridgewater, and found that while it was true that a great many persons died there of consumption, yet that the majority of these among the new-comers were from Boston, which city, with Roxbury, furnishes about *four sevenths* of all admitted at Bridgewater. Boston, also, with Cambridge, Charlestown and Chelsea, furnishes about *three sevenths* of the admissions at Tewksbury; so that, with respect to about half of the population of each of these two almshouses, there cannot be much difference in diseases peculiar to a locality. I found, also, that a very small percentage of recent deaths were Kanakas or Western Islanders—not enough to materially affect the statistics. I must, therefore, continue to believe that there is something unfavorable in the location or the hospital treatment at the Bridgewater Almshouse. * * * * *

"The law in regard to the admission of sick State paupers to the almshouses, while it has entailed a large expense upon the State, does not seem to have diminished the number of persons sent to the State Almshouses in a dying condition. Whether any further legislation is necessary, I would leave for your consideration."

The report of the indefatigable Secretary contains a vast amount of interesting information concerning the state of all our charities and those of other countries, as well as a valuable chapter on pauperism, crime and insanity.

At a meeting of the Suffolk District Medical Society, held April 4th, the following officers were appointed for the ensuing year :—*President*, Dr. H. I. Bowditch ; *Vice President*, Dr. J. Ayer ; *Secretary*, Dr. C. W. Swan ; *Treasurer*, Dr. J. N. Borland ; *Librarian*, Dr. C. Ellis ; *Supervisors*, Drs. G. H. Gay and F. H. Gray ; *Commissioner on Trials*, Dr. S. Durkee ; *Councillors*, Drs. J. Bigelow, S. Morrill, J. Jeffries, D. H. Storer, J. Flint, J. B. S. Jackson, J. Homans, A. A. Gould, A. A. Watson, E. Palmer, C. G. Putnam, H. I. Bowditch, H. G. Clark, J. M. Warren, G. C. Shattuck, C. E. Ware, S. L. Abbot, S. Cabot, G. Hayward, W. W. Morland, H. J. Bigelow, C. E. Buckingham, B. Brown, J. Ayer, F. Minot, J. B. Upham, G. H. Gay, H. W. Williams, C. Ellis, C. D. Homans, A. B. Hall, W. G. Wheeler (Chelsea), J. B. Forsyth (Chelsea), P. M. Crane (E. Boston) ; *Censors*, Drs. J. P. Reynolds, J. C. White, D. W. Cheever, B. J. Jeffries, H. F. Damon ; *Committee on Social Meetings*, James Ayer, H. I. Bowditch, C. D. Homans, C. G. Page, C. Stevens.

Anæsthesia by Freezing.—Since our extract from the London *Medical Times and Gazette* was in type, Dr. H. J. Bigelow has exhibited to the Boston Society for Medical Improvement a new agent by which the mercury is easily reduced to 15° or 20° below zero, instead of 6° below as by the process above described, and which seems to be greatly superior to the pure ether. We are promised a notice of this for our next number.

VITAL STATISTICS OF BOSTON.

For the Week ending Saturday, April 7th, 1866.

DEATHS.

	Males.	*Females.*	*Total.*
Deaths during the week - - - - - -	43	40	83
Ave. mortality of corresponding weeks for ten years, 1856—1866	41.0	40.0	81.00
Average corrected to increased population - - - -	00	00	88.23
Death of persons above 90 - - - - - - -		0	0

Married,—In Marlow, N. H., April 4th, Dr. A. P. Richardson, of Walpole, to Sylvia F. Symonds, of Marlow.

Died,—In Dexter, Me., March 15th, John B. Wilson, M.D., late Surgeon in charge U.S.A. General Hospital, Fort Gaines, Ala., aged 32 years. Dr. Wilson, though young in years, had won for himself renown in his profession. Leaving a good practice, he entered the army at the outbreak of the rebellion, and remained in the service until ill health compelled his return home. He served with credit as Medical Purveyor U. S. Forces in Texas, during the spring of 1864, and at this time contracted chronic diarrhœa, the disease which after two years suffering terminated his life. He was regarded as a reliable, prompt and thoroughly instructed medical officer, and from the soldiers under his care won a gratitude which will long keep him in remembrance. W.

Deaths in Boston for the week ending Saturday noon, April 7th, 83. Males, 43—Females, 40. Abscess, 2—accident, 2—apoplexy, 2—ascarides, 1—congestion of the brain, 1—disease of the brain, 3—bronchitis, 5—cancer, 1—cholera infantum, 1—consumption, 19—convulsions, 2—croup, 5—debility, 1—dropsy of the brain, 6—drowned, 2—scarlet fever, 2—typhoid fever, 2—gastritis, 1—hæmorrhage, 1—disease of the heart, 2—infantile disease, 2—insanity, 3—laryngitis, 1—disease of the liver, 1—inflammation of the lungs, 4—old age, 1—paralysis, 1—premature birth, 1—rheumatism, 1—scalded, 1—scrofula, 1—typhomania, 1—unknown, 4—whooping cough, 1.

Under 5 years of age, 33—between 5 and 20 years, 7—between 20 and 40 years, 16—between 40 and 60 years, 15—above 60 years, 12. Born in the United States, 55—Ireland, 21—other places, 7.